Wilmington Trust
MEMBER OF THE M&T FAMILY

Crypto as an Asset Class:
A Quantitative Look at Portfolio Impact

Phil Ravenscroft
Head of Portfolio Construction

Justin Clark
Senior Asset Management
Portfolio Manager

Key takeaways

- Cryptocurrency as an investment is not for the faint of heart. Past results do not guarantee future success.
- Bitcoin has grown to be the most established cryptocurrency by a wide margin, with Ether nipping at its heels. At this time, the volatility of cryptocurrency remains the primary stumbling block to broad inclusion in portfolios.
- We calculate that a 1% allocation to a blend of Bitcoin and Ether increases the portfolio's expected tracking error by the same amount as a 5% equity overweight.
- As the asset class matures, clear regulations are established, and investment accessibility continues to improve, reduced volatility could make cryptocurrency an effective portfolio diversifier.

There are few asset classes as polarizing as cryptocurrency. Some believe Bitcoin, the original and largest cryptocurrency, will replace the dollar and appreciate significantly—even after a 70% average annualized return over the last ten years.[1] Others think cryptocurrency represents a modern-day version of the 17th century tulip mania.

As a result, many investors are grappling with the question of whether Bitcoin, Ether, and other cryptocurrencies belong in portfolios.

Rather than opine here on the normative merits of cryptocurrency, we use portfolio construction analysis to illustrate under what conditions and in what size cryptocurrency may have a place in a diversified portfolio. While we focus on Bitcoin and Ether—the two largest and most easily investable of the cryptocurrencies—the same construct could be applied to other cryptocurrencies.

Our analysis concludes that crypto's current volatility makes an allocation more appropriate for a growth investor, or one with sufficient risk tolerance, rather than those with a more moderate risk appetite. For this burgeoning asset class to warrant a substantive allocation in a diversified portfolio, a continued decline in realized volatility is desirable.

The broader crypto landscape

The crypto market is always evolving. Bitcoin is the clear leader, with a market capitalization of around $2 trillion—about 4.5 times bigger than that of Ether, the next-largest cryptocurrency. In turn, Ether is about 4.5x bigger than Solana. Bloomberg currently lists 12 cryptocurrencies with a market cap greater than $10 billion.[2]

Bitcoin and Ether have the most public-market entry points among cryptocurrencies. Investing in smaller ones requires using a dedicated cryptocurrency exchange or even performing on-chain transactions. Bitcoin and Ether thus enjoy an "established" status in the crypto world, giving them a competitive advantage.

However, while Bitcoin is the clear incumbent among cryptocurrencies as an asset class, other dynamics could pose risks to its continued dominance. Network features such as smart contracts, transaction processing speeds, scalability, security and mining costs/energy requirements vary widely among cryptocurrencies, and the technological landscape is the very definition of dynamic and evolving. It's quite possible that the growth of cryptocurrencies as a group could decelerate. Ether derives its value from its role in the Ethereum network—a decentralized platform that enables applications and smart contracts as well as supporting stablecoins and other digital assets.

One of Bitcoin's original purposes was as a medium of exchange. We would argue that this use has diminished, due to factors such as high price volatility, scalability constraints and the rise of other forms of digital payment. In the cryptocurrency space, stablecoins—i.e., cryptocurrencies pegged to sovereign currencies such as the U.S. dollar and built on faster, lower-cost blockchains—have gained ground as the preferred medium for on-chain transactions. While Bitcoin's role as a medium of exchange has perhaps diminished, it continues to be viewed by some as a store of value, with stablecoins increasingly fulfilling the transactional function. Similarly, Ether exists as a store of value, but also as the native asset of the Ethereum network, which offers innovation and a distinct set of use cases, including smart contracts.

As the cryptocurrency asset class has matured, its volatility has declined. Cryptocurrencies have become more investable, with more "on ramps" in the form of a broader array of investment vehicles made available to a wider range of investors. The regulatory picture has also become clearer over time. As this process continues, Bitcoin, Ether and other cryptocurrencies may continue to exhibit a risk and return profile that make them an increasingly attractive addition to a balanced portfolio.

Looking at cryptocurrency through a portfolio construction lens

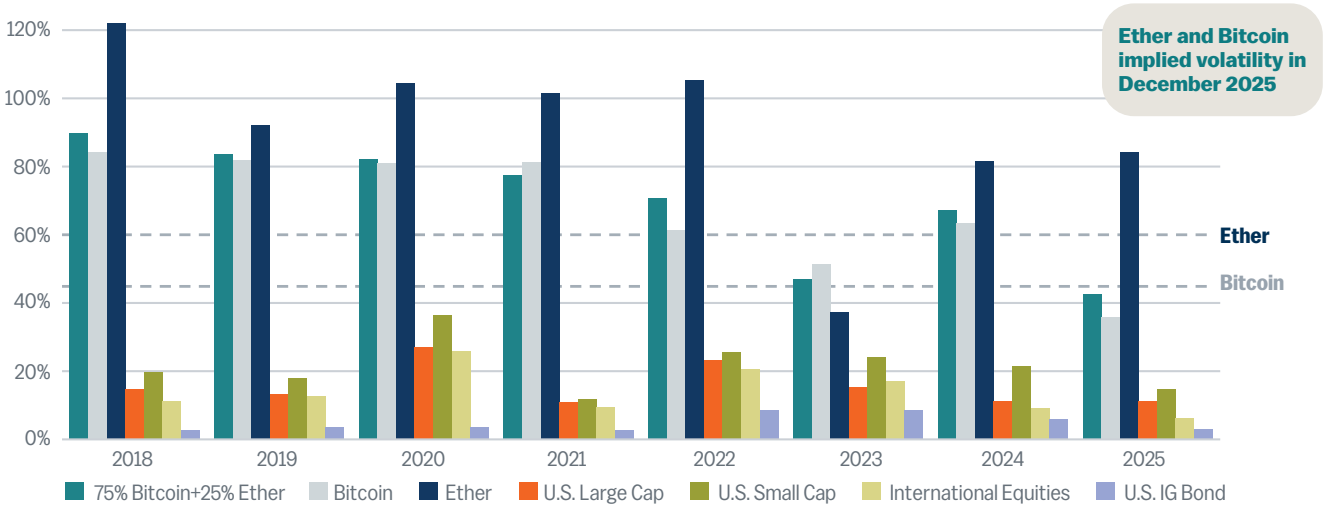
The decision to allocate capital to any asset class hinges upon the tradeoff between risk and return. Bitcoin and Ether have offered astonishing returns—but also have exhibited considerable volatility. Over the last 6 years, Bitcoin has returned more than a cumulative 20,000% (averaging 70% per year) and Ether has returned more than 244% (17% per year) for the almost eight years since March 2018. This compares to an almost 300% return for the S&P 500 over the last 10 years (a respectable 14.98% annualized). Yet, over that same period, both Bitcoin and Ether have experienced three drawdowns of more than 50%—with one larger than 75%.[3]

Clearly, investing in even the most established cryptocurrencies has not been for the faint of heart. In addition, for those with the wherewithal to ride through its volatility, crypto's past strong results do not guarantee future success.

Figure 1

Cryptocurrency volatility has taken investors on a wild ride

3 year rolling standard deviation of Bitcoin, Ether and major equity and fixed income indices



For a list of indices used for this analysis, please see the Appendix.

Sources: Bloomberg, Wilmington Trust. Chart shows a 3-year rolling standard deviation for Bitcoin.

Looking at cryptocurrency quantitatively

Evaluating an asset's role in a portfolio requires assumptions about future risk and return.

Given the relatively short history of Bitcoin and Ether, their return streams are difficult to extrapolate. There is considerable debate about the best way to project future returns using fundamental analysis. Instead, we use a reverse-engineering approach to determine what it would take from a risk-return standpoint to justify a Bitcoin position in a diversified portfolio. Viewing cryptocurrencies through a portfolio construction lens allows us to examine both whether return expectations are realistic and the type of risk profile for which they may be best suited.

Risk: Bitcoin volatility and correlations

Bitcoin and Ether, like other cryptocurrencies, have clearly been quite volatile (Figure 1).[4] While the level of volatility—measured as the annualized standard deviation of historical returns over a rolling three-year window—has decreased over time, it remains around 36% for Bitcoin and 84% for Ether. By comparison, the Russell 1000 Index (representing the stocks of the 1,000 largest U.S. companies) has a standard deviation of around 11%.[5] At the time of writing, the implied volatility of at-the-money (ATM) options on Bitcoin futures is approximately 45% and 63% for Ether.[6] With volatility at multiples of U.S. large-cap equities, Bitcoin and Ether continue to exhibit a high level of risk relative to other asset classes.

Along with volatility, the other major consideration when it comes to the risk of an asset class is how it moves with other asset classes. Measuring co-movement using correlation is one way to look at an asset class's diversification benefit.[7] For instance, an asset class with low or even negative correlation to another asset can be useful in reducing portfolio volatility even if the asset class itself has relatively high volatility.

Figure 2

Cryptocurrencies' correlation profile could add diversification benefits to a portfolio

Correlations of a 75/25% blend of Bitcoin and Ether versus major asset classes through November 2025 (monthly returns)

	Last 1 Year	Last 3 Years	Since Aug 2010
US Equities	0.55	0.54	0.44
International Equities	0.43	0.28	0.34
US High Yield Bonds	0.27	0.29	0.41
US IG Bond	-0.61	0.13	0.17
Alternatives	0.31	0.28	0.36
BB Commodity	-0.45	-0.16	0.15
Gold	-0.14	-0.01	0.08
Silver	-0.18	-0.17	0.13
Average	**-0.02**	**0.14**	**0.26**

Sources: Bloomberg, Wilmington Trust. Correlations are calculated using monthly returns. For a list of indices used for this analysis, please see the Appendix. U.S. Equities shows combined data for large- and small-cap equities weighted by market cap.

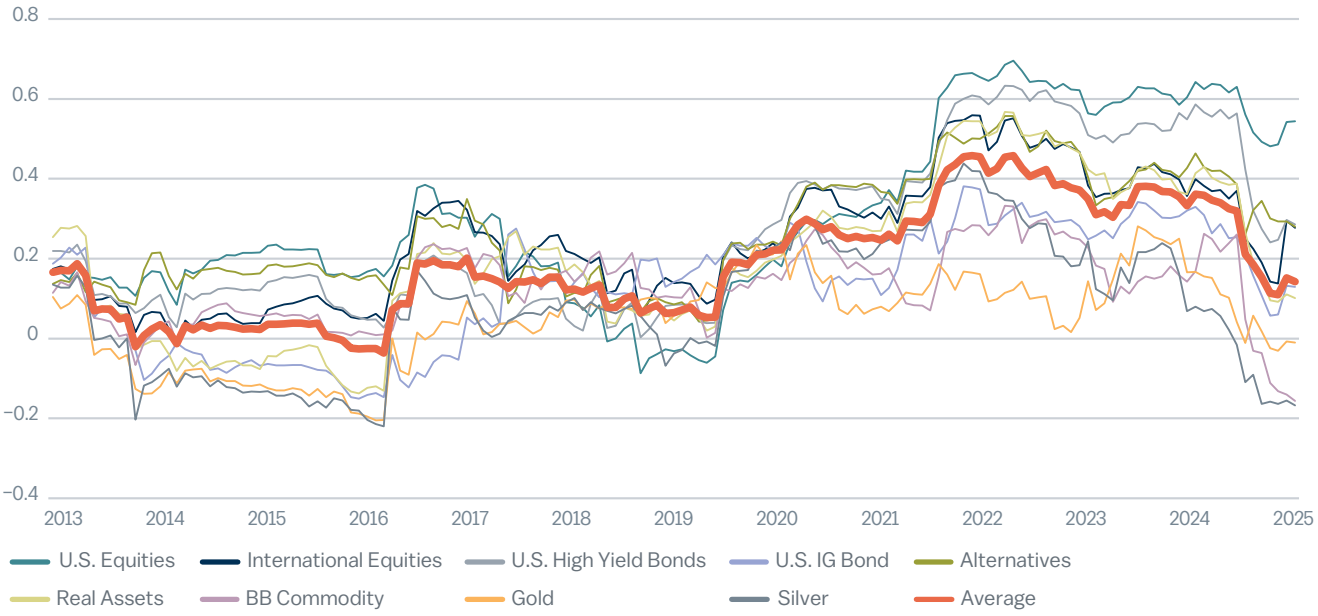
The correlation of cryptocurrency returns with those of other major asset classes has historically been erratic. For many asset classes, correlations to Bitcoin and Ether have been low to moderate, particularly over longer time periods (Figure 2). It is noteworthy that these cryptocurrencies are most strongly correlated with U.S. equities and most weakly correlated to gold—the original, physical store of value asset.

Interestingly, the Bitcoin/Ether blend's correlation to equities has increased over the last one- and three-year windows. In fact, the correlation to all major asset classes has steadily increased over time, particularly in the post-COVID period (Figure 3).

Figure 3

Bitcoin's cross-asset correlations are increasing

3-year rolling correlation between Bitcoin and other major asset classes



Sources: Bloomberg, Wilmington Trust. Shows correlation of a blend of 75% Bitcoin/25% Ether to major asset classes. Before 2018 (when Ether return series begins), 100% Bitcoin is used. For a list of indices used in this analysis please see the Appendix. Data as of 12/31/2025.

Figure 4

A 1% allocation to a 75%/25% blend of Bitcoin and Ether adds the same amount of risk as a 5% overweight to equities

Cryptocurrency and Tracking Error Equivalencies

Bitcoin and Ether allocation	Tracking error	Estimated equity overweight to match
0.5%	0.3%	2.5%
1.0%	0.5%	5.0%
1.5%	0.8%	7.6%
2.0%	**1.1%**	**10.1%**
2.5%	1.4%	12.6%
3.0%	1.6%	15.1%

Table shows the Bitcoin and corresponding equity overweight or underweight required to reach the same expected tracking error.

Sources: Bloomberg, Wilmington Trust.

This upward trend in correlation is consistent with cryptocurrency, particularly Bitcoin, becoming more of a mainstream asset class. While its historical correlation profile could help diversify a portfolio, Bitcoin's increased co-movement with major asset classes in recent years reduces some of that benefit—especially with volatility nearly four times that of U.S. large-cap equities. In 2025, correlations decreased, largely due to a drop in cryptocurrency prices while other asset classes exhibited strong performance.

The equity-risk equivalent of Bitcoin

One last way we can illustrate the risk associated with an allocation to cryptocurrency is to estimate its equivalent equity risk. In other words, we can consider the volatility and correlation characteristics of a blend of Bitcoin and Ether in terms of the equity overweight (versus a strategic benchmark) required to generate the same increase in portfolio tracking error (Figure 4).[8]

We calculate that adding a blend of Bitcoin and Ether to the portfolio introduces approximately the same amount of tracking error as a 400% larger equity overweight, which is consistent with our earlier standard deviation comparison. This means that a 1% allocation to Bitcoin and Ether increases the portfolio's expected tracking error by the same amount (0.5%) as a 5% equity overweight. A moderate 3% allocation to Bitcoin and Ether introduces tracking error equivalent to taking a 15% overweight to equities. For many investors, that would bump a portfolio into an entirely different risk profile.

Fundamental valuation techniques

There are two broad considerations in assessing the investment opportunity of an asset. The first is fundamental valuation and the second is quantitative. While this paper focuses on quantitative portfolio construction techniques, it is worth discussing fundamental valuation techniques as well.

Since Bitcoin and Ether do not provide cash flows like stocks and bonds, discounted cash flow analysis—the most fundamental of the fundamental valuation techniques—does not apply. This does not mean that cryptocurrencies cannot have a place in portfolios, as there are numerous assets, such as many commodities, that do not have cash flows yet play a role in a diversified portfolio.

Some valuation models are specific to the cryptocurrency space. An example is the production cost model, which looks at the cost of mining Bitcoin. This cost is largely determined by electricity prices and has historically provided a longer-term floor on Bitcoin prices, since miners cannot profitably operate below it. Another framework is Metcalfe's Law, which values cryptocurrencies as a network, with the value proportional to the square of the number of nodes (i.e., users). Finally, on-chain metrics are truly unique to cryptocurrency assets, since they analyze data recorded on the blockchain to estimate valuation, sentiment, and investor behavior.

Another popular technique is the "stock to flow" model, which compares the supply ("stock") of a cryptocurrency to newly created coins ("flow"). This concept can also be applied to traditional precious metals such as gold and silver. Finally, there are relative price models comparing cryptocurrencies to their precious metal counterparts.

Crypto security and custody

The security of cryptocurrency lies in public and private keys. A public security key is shared with others, often in the form of a wallet address and is akin to a phone number or email address. A private key can be thought of as your digital password. Losing it effectively means losing the asset itself. Exposing a private key to others puts your cryptocurrency funds at risk of being stolen. This makes custody of keys incredibly important, whether by an individual or an organization.

Exposure to Bitcoin, Ether, and other cryptocurrencies is available in a variety of ways. Examples include direct on-chain transactions, transactions on crypto exchanges, futures contracts, and exchange-traded products such as exchange-traded funds (ETFs). These vehicles vary in terms of complexity.

When trading directly on the blockchain and crypto exchanges, one must maintain both public and private security keys. Investors must carefully manage transactions occurring directly on the blockchain, as mistakes such as sending funds to the wrong address or losing a private key can lead to permanent losses. Furthermore, transaction fees and network latency can vary significantly, which can increase the cost and complexity of moving funds on-chain.

Keeping digital assets on crypto exchanges simplifies some of these issues, but counterparty risk and potential security breaches can be serious concerns. The emergence of crypto futures contracts and exchange-traded products such as ETFs transfer the burdens and risks of custody to the product provider. While futures and ETFs still have custody requirements, they are more heavily regulated than crypto exchanges. Futures (and ETFs that hold futures) can experience price divergence from the underlying cryptocurrency.

In early 2024, the Securities and Exchange Commission approved spot ETFs, which directly hold cryptocurrency. At the time of writing, the largest Bitcoin ETF is the iShares Bitcoin Trust ETF (IBIT), which has $70 billion in assets, trades about $2.5 billion per day and charges a 0.25% management fee. The largest Ether ETF is the iShares Ethereum Trust ETF (ETHA), which has $11 billion in assets, trades about $640 million per day and charges a 0.25% management fee.[9]

Finally, trust in blockchain itself is critical: the very structure of the Bitcoin ecosystem must be trusted to ensure long-term viability. Bitcoin and Ether's value proposition is rooted in trustless, decentralized consensus. Confidence in the security, immutability, and integrity of the blockchain is key. The good news is that the Bitcoin ecosystem, over its roughly 15-year history, has earned credibility. It has never suffered a hack at the protocol level itself and has built-in transparency and auditability (i.e., anyone can inspect and verify a transaction's entire history).

Analyzing expected returns

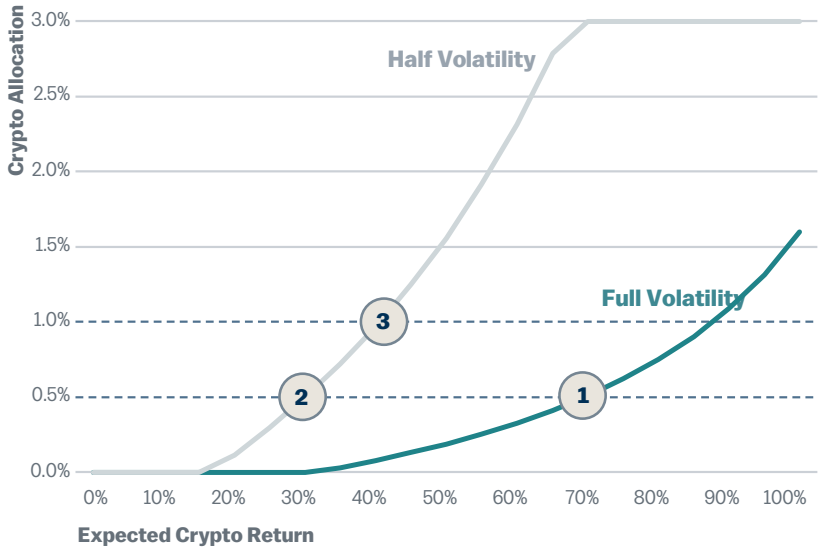
Now that we have explored multiple approaches to gauge the risk of cryptocurrencies, we can turn to expected return. If expected returns are high enough, they can compensate for the extra risk assumed (depending on an investor's individual risk tolerance, of course).

In this section, we utilize a series of optimizations to calculate the expected return of a 75%/25% blend of Bitcoin and Ether at given levels of volatility, while keeping other assumptions constant.[10] This allows us to solve for an allocation to Cryptocurrencies that maximizes the portfolio's Information Ratio.[11] There are different ways to fund an allocation to cryptocurrency. We chose to fund proportionally from real assets so that the sum of allocations to real assets and cryptocurrency is constant.

Figure 5

Portfolio allocation to cryptocurrency may be difficult to justify at current volatility

Cryptocurrency allocation by expected return and risk



Sources: Bloomberg, Wilmington Trust. Cryptocurrency allocation is a blend of 75% Bitcoin/25% Ether. Assumes "full" volatility, (estimated as exponentially weighted standard deviation) and "half" volatility.

In Figure 5, we can see that using the current realized volatility (55% standard deviation, teal line), the portfolio optimization requires a roughly 65% annual return to justify an allocation of 50 basis points to cryptocurrency (point 1 on the chart.) However, assumptions are critical, particularly when it comes to volatility. If we reduce volatility by half, the optimizer allocates 50 basis points at "just" a 30% expected annual return (point 2) and 100 basis points at about 40% expected annual return (point 3).

This shows us just how high cryptocurrency expected returns must be to offset its volatility, even if we assume volatility continues to decrease in coming years. Our return assumptions are comparable to history but could become less attainable as the asset class matures.

The market's expectations for cryptocurrencies' future returns can be helpful to consider as well. One way to gauge what the market expects for the returns of an asset class is to employ the reverse optimization used in the first step of the Black-Litterman model. This approach suggests a market-implied return of about 16% for Bitcoin and a 21% return for Ether—greater than that of equities (Figure 6).[12]

If we take these implied returns and refer to our optimization analysis from Figure 5, we see that with a 17% expected return for the blend of Bitcoin and Ether, the optimization would not recommend an allocation to at current volatility levels. Cryptocurrency has certainly achieved high returns in the past: Bitcoin annual returns for 2023 and 2024 exceeded 100%. However, extrapolating those types of returns carries significant risk of disappointment. Investing with a margin of safety means allocating to asset classes where there is a greater chance of surprising to the upside. Unless volatility is significantly reduced, it is hard to find a margin of safety in allocating to cryptocurrency.

Figure 6

Market-implied returns may suggest that Bitcoin and Ether outperform U.S. large-caps

Black-Litterman implied returns as of October 31, 2025

Asset Class	Implied Returns
Ether	21.1%
Bitcoin	16.1%
U.S. Small Cap	9.7%
U.S. Large Cap	8.0%
EAFE Equities	7.3%
EM Equities	7.1%
U.S. High Yield Bonds	3.5%
Global Bond xU.S., Unhedged	2.9%
U.S. IG Bond	1.6%

Sources: Bloomberg, Wilmington Trust

Bitcoin as a store of value and safety trade

In certain circles, Bitcoin has a reputation as a store of value or hedge against tail risk: in other words, an asset that can retain value in a market drawdown. On their own, the risk characteristics we analyze in this piece would suggest that there is not a very strong case to be made for this. Here, we lay out the major arguments for and against Bitcoin as a store of value/tail-risk hedge.

Scarcity by design. Advocates point out that the supply of Bitcoin is capped at 21 million coins and that it can't be diluted like traditional fiat currency. This engineered scarcity and immunity to dilution makes it a digital analog to physical gold, giving it the same status as a store of value. But the broader crypto market faces the challenge of meta-dilution in that new coins are constantly being introduced and are, in some sense, substitutes for one another. Even if Bitcoin is capped at 21 million coins, a constant influx of new digital assets effectively expands the supply, undermining the argument for absolute scarcity.

Decentralized nature. Bitcoin, like other cryptocurrencies, is decentralized, as the blockchain is a distributed ledger of transactions maintained by a global network of nodes. Transactions are verified independently across nodes using consensus rules so that no single entity or node can alter the ledger or control the currency. In other words, the design of the blockchain obviates the need for a central authority.

On the other hand, many Bitcoin holders do not hold the cryptocurrency directly but, rather, rely on third-party intermediaries such as crypto exchanges, custodial wallets or ETFs. While an individual investor can hold Bitcoin directly, recent developments—particularly the advent of Bitcoin ETFs and the corresponding asset flows— are consistent with a trend toward centralized custody.

Global liquidity and around-the-clock accessibility. Bitcoin proponents point out that the cryptocurrency trades 24/7 globally and with almost immediate settlement, unlike centralized traditional exchanges. This continuous liquidity allows participants to always access Bitcoin, even in times of turmoil for traditional markets. In practice, however, this liquidity often depends on centralized exchanges, brokers or vehicles that are not active 24/7.

Historically low correlations. Bitcoin supporters also have claimed that it trades independently of traditional assets. They point to instances where the cryptocurrency was stable in value, or even appreciating, when traditional assets such as equities or fiat currencies were under pressure.

As we see in the piece, the correlation between Bitcoin and traditional asset classes has increased through time. In fact, as we have demonstrated, Bitcoin behaves similarly to a leveraged bet on equities and, as such, has the characteristics of a risky asset.

One way to measure an asset's ability to hedge tail risk is by looking at its downside capture ratio. This metric shows how an asset has behaved relative to a benchmark during periods when the benchmark declines. Specifically, it indicates what percentage of a benchmark's negative performance is reflected in the asset's performance. A downside capture ratio above 1.0 means that an asset has lost more than the benchmark during downturns. A positive ratio below 1.0 means that the asset has lost less than the benchmark, and a negative ratio means the asset has gained when the benchmark fell.

As expected from an asset as volatile as Bitcoin, its downside capture ratio has been volatile through time. Since we are trying to quantify its ability to hedge tail risk, we examine its downside capture ratio during larger drawdowns, specifically periods where the S&P 500 has declined more than 10%.

Figure 7

Bitcoin, Ether and gold returns during S&P 500 drawdown

Returns in S&P 500 drawdowns exceeding -10% sorted by drawdown length

	S&P 500	Bitcoin	Ether	Gold	Silver
October 8, 1997 — October 27, 1997	−10.8%			−6.1%	
July 20, 1998 — August 31, 1998	−19.2%			−6.9%	
July 19, 1999 — October 15, 1999	−11.8%			23.5%	
March 27, 2000 — April 14, 2000	−11.1%			−1.0%	1.0%
September 5, 2000 — October 9, 2002	−47.4%			15.4%	−12.1%
October 10, 2007 — March 9, 2009	−55.3%			25.5%	1.1%
July 21, 2015 — February 11, 2016	−13.0%	35.2%		12.3%	5.5%
January 29, 2018 — February 8, 2018	−10.1%	−30.5%		−2.8%	−6.1%
September 21, 2018 — December 24, 2018	−19.4%	−36.3%	−31.8%	4.1%	3.1%
February 20, 2020 — March 23, 2020	−33.8%	−33.3%	−49.5%	−4.9%	−31.8%
January 4, 2022 — October 12, 2022	−24.5%	−58.3%	−65.1%	−7.5%	−16.9%
February 20, 2025 — April 8, 2025	−18.7%	−20.0%	−45.4%	2.7%	−7.9%
Mean	−22.9%	−23.9%	−48.0%	4.5%	−7.1%
Median	−19.0%	−31.9%	−47.5%	0.8%	−6.1%
Capture Ratio (Mean)		104.1%	209.3%	−19.8%	31.1%
Capture Ratio (Median)		168.1%	250.2%	−4.4%	32.0%
Correlation		47.2%	39.3%	−44.6%	26.3%

Sources: Bloomberg, Wilmington Trust. As of date is April 2025. Past performance cannot guarantee future results. Gold: iShares Gold Trust ETF (IAU).

In Figure 7, we see that during larger S&P 500 drawdowns (i.e., more than 10%), Bitcoin and Ether have downside capture ratios well in excess of 1, meaning that during sharp stock market selloffs, they have fallen by a larger magnitude than the S&P 500. Gold, which is widely considered a tail risk hedge, on the other hand, has exhibited a negative downside capture on average.

On the sidelines for now, but watching closely

Cryptocurrencies, such as Bitcoin and Ether, constitute a young and emerging asset class with many exciting attributes, but also with some of the hallmarks of a speculative fervor. They have enjoyed substantial returns—even relative to their volatility—over the last several years. Bitcoin and Ether have grown to be the most established cryptocurrencies by a wide margin, but their volatility is still a stumbling block, making the asset class potentially more appropriate for risk-seeking investors.

Currently, we do not recommend an allocation to Bitcoin or other cryptocurrencies in a diversified portfolio of moderate or low risk. However, a small allocation may be appropriate in more aggressive portfolios for certain investors who are interested in cryptocurrency and can bear the risk that comes with investing in the asset class. Despite becoming more of a mainstream asset class, it is important to keep in mind that cryptocurrency does continue to act as a turbocharged risk asset.

We continue to watch Bitcoin, Ether, and other cryptocurrencies closely. In the future, cryptocurrency's role in a portfolio should continue to be a function of its volatility profile and also, more generally, of its maturity as an asset class. Bitcoin and Ether have been on a trajectory of gaining maturity, declining volatility, expanding investor base, and regulatory clarification. As this trend continues, we would anticipate it being more broadly accepted as an investment in diversified portfolios.

APPENDIX

ENDNOTES

1 Bloomberg Bitcoin Index and Bloomberg Ether Index, as of October 31, 2025.

2 As of October 31, 2025.

3 Bloomberg Bitcoin Index and Bloomberg Ether Index, as of October 31, 2025.

4 Volatility describes the degree of fluctuation in an asset's returns over time. Standard deviation is the statistical measure used to quantify volatility based on historical data. Implied volatility represents the market's expectation of future price movements as inferred from option prices.

5 As of October 31, 2025. Sources: Bloomberg, WTIA.

6 Implied volatility of at-the-money options on the front-month CME Bitcoin contract.

7 Correlation measures how closely two assets move in tandem. A correlation of one means that their prices move together almost perfectly, while a correlation of minus one means that they move nearly perfectly in opposite directions. A zero correlation indicates that the two assets move independently.

8 Tracking error is the standard deviation of a portfolio versus its benchmark.

9 Bloomberg. Data as of October 31, 2025.

10 Covariances are based on longer-term exponentially weighted correlations (equivalent to about six years) and standard deviations (about three years); asset class returns (except for Bitcoin and Ether) are based on longer-term annualized returns (about 14 years covering the time span in which we have common returns for all asset-class indexes).

11 Information Ratio is defined as expected return over the benchmark divided by expected tracking error.

12 We use the first step of the Black-Litterman model, known as reverse optimization. Instead of assuming that expected returns are known inputs (as in traditional mean-variance optimization) and obtaining the weights of a portfolio, reverse optimization derives the implied excess returns from a given market-cap-weighted portfolio. In other words, instead of finding weights assuming covariance and expected returns, we find expected returns assuming covariance and weights. We also have to choose a baseline level of return for existing asset classes. Here, we assume a 6% return for large cap stocks and the model solves for returns of other asset classes.

Market indexes used for analysis in this document, and corresponding Bloomberg tickers, are as follows:

Alternatives: HFRX Global Hedge Fund Index (HFRXGL).

Basis point (bps) is a unit of measure used to indicate percentage changes in financial instruments. (1 basis point equals 0.01%.)

Bitcoin: Spot Bitcoin/USD exchange rate (XBTUSD).

Bloomberg Commodity Index is a broad-based commodities benchmark that tracks the price of a diversified basket of futures contracts on physical commodities across sectors such as energy, metals, agriculture, and livestock. It is designed to limit concentration, ensuring no single commodity or sector dominates the index. BCOM reflects global economic significance and market liquidity through rules-based weighting.

Cash: Bloomberg US Treasury Bills Total Return Index (LD20TRUU).

Global non-USD bonds: Bloomberg Global Aggregate Ex-USD Bond Total Return Index (LG38TRUU).

International equities: MSCI EAFE USD Total Return Index (NDDUEAFE), MSCI Emerging Markets USD Total Return Index (NDUEEGF). International weights approximately 70% EAFE/30% EM.

LBMA Gold Price is the global benchmark price for unallocated gold delivered in London, determined via an independent electronic auction administered by ICE Benchmark Administration (IBA). It is used globally by producers, refiners, financial institutions, and investors for pricing, valuation, and settlement of gold-related transactions.

LBMA Silver Price is the global benchmark price for unallocated silver delivered in London, also set through a daily electronic auction process administered by IBA. It serves as a widely recognized reference point for physical and financial silver transactions, used for pricing, settlement, and valuation across global markets.

MSCI EAFE market-capitalization-weighted equity index designed to measure the performance of developed markets outside the United States and Canada. It includes large- and mid-cap companies across approximately 20–21 developed countries, such as the United Kingdom, France, Germany, Switzerland, Japan, Australia, and Singapore.

MSCI Emerging Markets Index is a free float-adjusted, market-capitalization-weighted equity index designed to measure the performance of large- and mid-cap companies across emerging market countries.

Non-US equities: MSCI All Country World Ex-US Index (NDUEACWZ) USD Total Return Index.

Real assets: 50% S&P Developed Property USD Total Return Index (SPBMWDUT) / 50% Bloomberg Commodity Index USD Total Return Index (BCOMTR).

U.S. equities (large cap): Russell 1000 Total Return Index (RU10INTR).

U.S. equities (small cap): Russell 2000 Total Return Index (RU20INTR). U.S. equity weights approximately 95% R1K/5% R2K

U.S. high yield bonds: Bloomberg US Corporate High Yield Bond Total Return Index (LF98TRUU).

U.S. investment-grade bonds: Bloomberg US Aggregate Bond Total Return Index (LBUSTRUU).

The gold industry can be significantly affected by international monetary and political developments as well as supply and demand for gold and operational costs associated with mining.

DISCLOSURES

Investing involves risks, and you may incur a profit or a loss. Past performance cannot guarantee future results.

Crypto as an asset class can become illiquid at any time. Crypto may be more susceptible to market manipulation than securities. Investors in crypto do not benefit from the same regulatory protections applicable to registered securities.

This article is for educational purposes only and is not intended as an offer or solicitation for the sale of any financial product or service or as a determination that any investment strategy is suitable for a specific investor. Investors should seek financial advice regarding the suitability of any investment strategy based on their objectives, financial situations, and particular needs. This article is not designed or intended to provide financial, tax, legal, accounting, or other professional advice since such advice always requires consideration of individual circumstances. If professional advice is needed, the services of a professional advisor should be sought.

References to specific securities are not intended and should not be relied upon as the basis for anyone to buy, sell, or hold securities and asset classes to include Bitcoin and Ether, which are not securities.. Holdings and sector allocations may not be representative of the portfolio manager's current or future investments and are subject to change at any time.

The information in this article has been obtained from sources believed to be reliable, but its accuracy and completeness are not guaranteed. The opinions, estimates, and projections constitute the judgment of Wilmington Trust and are subject to change without notice. The investments or investment strategies discussed herein may not be suitable for every investor. There is no assurance that any investment strategy will be successful.

Third-party trademarks and brands are the property of their respective owners. Third parties referenced herein are independent companies and are not affiliated with M&T Bank or Wilmington Trust. Listing them does not suggest a recommendation or endorsement by Wilmington Trust.

Diversification does not ensure a profit or guarantee against a loss. There is no assurance that any investment strategy will succeed.

Stock risks:

Different types of investments involve varying degrees of risk, and there can be no assurance that the future performance of any specific investment, investment strategy, or product made reference to directly or indirectly in this document will be profitable or equal any corresponding indicated historical performance level(s).

Securities markets are volatile and the market prices of securities may decline. Securities fluctuate in price based on changes in a company's financial condition and overall market and economic conditions.

Wilmington Trust is a registered service mark used in connection with various fiduciary and non-fiduciary services offered by certain subsidiaries of M&T Bank Corporation including, but not limited to, Manufacturers & Traders Trust Company (M&T Bank), Wilmington Trust Company (WTC) operating in Delaware only, Wilmington Trust, N.A. (WTNA), Wilmington Trust Investment Advisors, Inc. (WTIA), Wilmington Funds Management Corporation (WFMC), Wilmington Trust Asset Management, LLC (WTAM), and Wilmington Trust Investment Management, LLC (WTIM). Such services include trustee, custodial, agency, investment management, and other services. International corporate and institutional services are offered through M&T Bank Corporation's international subsidiaries. Loans, credit cards, retail and business deposits, and other business and personal banking services and products are offered by M&T Bank. Member, FDIC.

